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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/760,544

01/21/2004

Hyung-sok Yeo

249/443

8654

27849 7590 01/23/2008

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EXAMINER

MALLARI, PATRICIA C

ART UNIT

PAPER NUMBER

3735

MAIL DATE

DELIVERY MODE

01/23/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/760,544	<b>Applicant(s)</b> YEO ET AL.	
	<b>Examiner</b> PATRICIA C. MALLARI	<b>Art Unit</b> 3735	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 January 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16 is/are allowed.
- 6) ☒ Claim(s) 1,2,14,17,18 and 20 is/are rejected.
- 7) ☒ Claim(s) 3-13,15,19,21-24 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/5/06, 6/29/04, 1/21/04</u> .                                | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The information disclosure statements filed 4/5/06, 6/29/04, and 1/21/04 have been considered.

The Barnea reference appears on both statements filed 6/29/04 and 1/21/04. The reference has been crossed out on the statement filed 6/29/04 to eliminate duplication citations. The statement filed 6/29/04 also lists the titles of the patent abstracts separately from the rest of each citation on p.2. The separate listings of the titles have been crossed out and inserted with the rest of the citation.

### ***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 4,759,366 to Callaghan in view of US Patent No. 6,496,723 to Kawachi

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et al. Callaghan discloses a method of evaluating human stress comprising defining at least one parameter (the occurrence of a peak or R wave), measuring a signal during a predetermined period of time, and evaluating a level of human stress using a plurality of stress indexes (peak to peak intervals) obtained from the parameter. Callaghan teaches the signal being an ECG signal rather than the signal being a PPG signal (see entire document, especially col.2, lines 27-65; col. 6, lines 8-38 of Callaghan).

However, Kawachi teaches that peak to peak intervals in a pulse wave correspond to and is suitable for substitution for the R-R or peak to peak intervals in an ECG, and that such peak to peak intervals may be obtained from a PPG signal (see entire document, especially col. 1, lines 22-34 and lines 54-65; col. 3, lines 8-39 of Kawachi). The PPG signal is obtained by radiating light having at least one wavelength, which reacts to a blood component to be measured, at a measuring target (see entire document, especially col. 1, lines 34-43; col. 2, lines 59-col. 3, line 8 of Kawachi). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use a PPG signal peak to peak interval of the pulse wave in place of the ECG signal and peak to peak interval of the ECG waveform of Callaghan, since Kawachi shows that the peak to peak interval of the pulse wave signal corresponds to and is suitable for substitution for the peak to peak interval of the ECG signal and it would merely be the substitution of one known index for another known equivalent index.

Regarding claim 2, the at least one PPG parameter is a pulse component amplitude.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Callaghan in view of Kawachi, as applied to claims 1 and 2 above, and further in view of US Patent No. 6,280,390 to Akselrod et al. Callaghan lacks low pass filtering the signal. However, Akselrod teaches a PPG signal measuring unit, wherein the acquired signal is low-pass filtered to remove high-frequency noise (see entire document, especially col.11, lines 56-57 of Akselrod). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to combine the filter of Akselrod with the apparatus of Callaghan, as modified, in order to eliminate noise, thereby ensuring a more accurate result.

Claims 14, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Callaghan in view of Kawachi, as applied to claims 1 and 2 above, and further in view of US Patent No. 6,261,236 to Grimblatov. Regarding claim 17, Callaghan, as modified, teaches a PPG measuring unit which radiates light having at least one wavelength, which reacts to a blood component to be measured, at a measuring target and measures a PPG signal from the measuring target during a predetermined period of time (see entire document, especially col. 2, line 59-col. 3, line 8 of Kawachi) and signal processing unit as claimed (see entirety of both documents, especially col.2, lines 27-65; col. 6, lines 8-38 of Callaghan; col. 3, lines 8-28 of Kawachi). Callaghan, as modified, lacks an amplifying and filtering unit.

However, Grimblatov discloses a PPG sensor, wherein an amplifying and filtering unit amplifies the PPG signal and performs filtering to remove noise components prior to delivering the signal to a signal processing unit (see entire document, especially figs. 9 & 10; col. 9, line 41-col. 10, line 3; col. 11 lines 31-59 of Grimblatov). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to combine the amplifying and filtering unit of Grimblatov with the apparatus of Callaghan, as modified, in order to obtain a more accurate, less noisy signal.

Regarding claim 14, the filter is a low-pass filter (see entire document, especially col. 1, lines 46-49 of Grimblatov).

Regarding claim 18, the PPG parameter is a pulse component amplitude.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Callaghan in view of Kawachi and Grimblatov, as applied to claims 17 and 18 above and further in view of US Patent No. 5,413,101 to Sugiura. Callaghan, as modified, shows the measuring unit as having a reflective structure but having a block shape rather than a "C" shape. However, Sugiura discloses a PPG measuring unit having a "C" shape (see entire document, especially figs. 1-4 of Sugiura). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use the shape of the unit of Sugiura in place of that Callaghan, as modified, as it would merely be the substitution of one known measuring unit shape for another.

***Allowable Subject Matter***

Claims 3-13, 15, 19, 21-24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 16 is allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 3, 5-10, 16, and 19, the primary reason for allowance is the inclusion of evaluating level of human stress comprising using one of a long-term test and a short-term test, which are identified depending on a measuring time of the PPG signal, in combination with all of the other limitations of the claims, which is not found in the prior art.

Regarding claims 4, 11, 12, and 21-24, the primary reason for allowance is the inclusion of the evaluating the level of stress comprising obtaining an average of pulse component amplitudes during a predetermined period of time, comparing a baseline spread range with the average and calculating a relative stress index based on a relationships between the baseline spread range and the average in combination with all of the other limitations of the claims, which is not found in the prior art.

Regarding claims 13, the primary reason for allowance is the inclusion of averaging the plurality of stress indexes and determining an average stress index as a final stress index, in combination with all of the other limitations of the claims, which is not found in the prior art.

Regarding claim 15, the primary reason for allowance is the inclusion of displaying the plurality of stress indexes and the evaluated level of human stress obtained during evaluating the level of human stress, in combination with all of the other limitations of the claims, which is not found in the prior art.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICIA C. MALLARI whose telephone number is (571)272-4729. The examiner can normally be reached on Monday-Friday 10:00 am-6:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Marmor, II can be reached on (571) 272-4730. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Patricia C. Mallari/  
Examiner, Art Unit 3735

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